2008 ROCS Workshop

October 12, 2008

SESSION 1 – GaN Modeling and Failure Analysis

SESSION 2 – Passive Structures and Packaging

SESSION 3 – Reliability Under Application Conditions

SESSION 4 – GaN Lifetests

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Reliability and Degradation Mechanisms Of AlGaN/GaN HEMTs for Next Generation Mobile Communication Systems

Dammann , Pletschen , Waltereit , Bronner , Quay , Müller , Mikulla , Ambacher , van der Wel, Rödle, Behtash , Bourgeois , Riepe, Fagerlind , and Sveinbjörnsson

In-house reliability station

DC and RF (2 & 10 GHz) Testing

Test bench for DC or RF stress of 40 devices at 2 or 10 GHz

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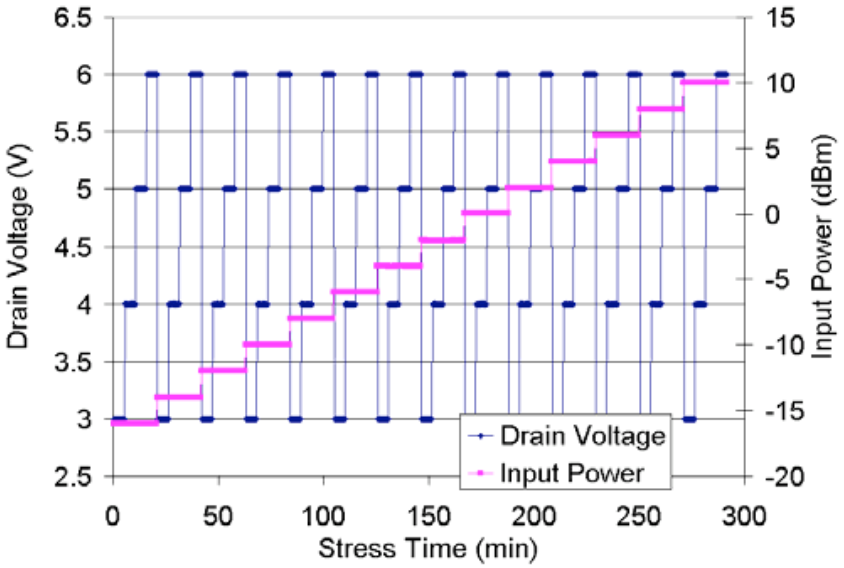
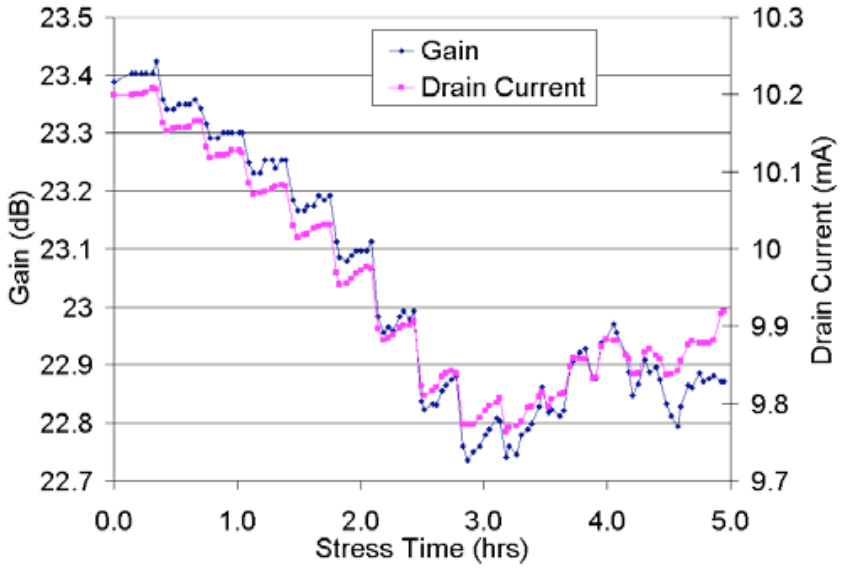
Method for Determining DC/RF Survivability Limits of Semiconductor Circuits

Gil, Ersland, Li; M/A-COM





- Combination of RF and DC ramping both
- Most of the degradation happens in the first hours.
- Most significant changes happens with RF stress

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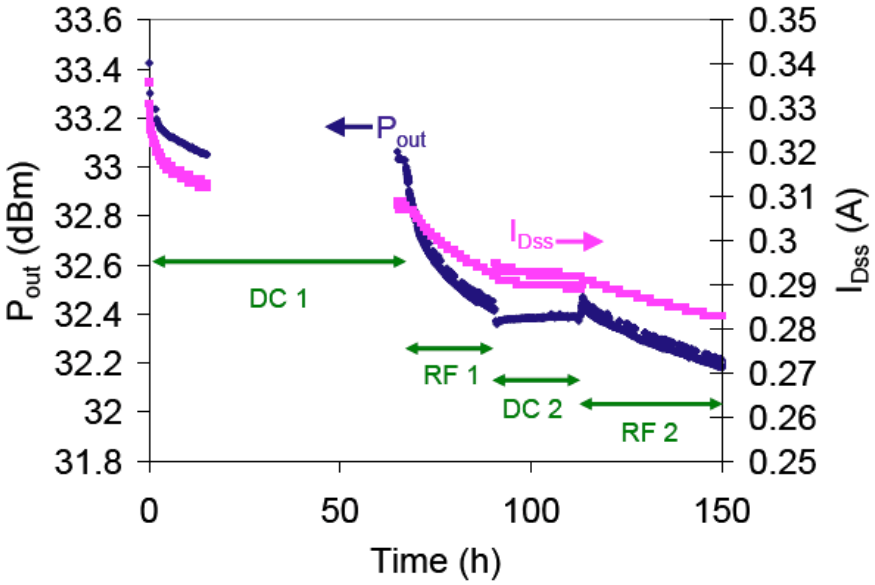
Correlation between RF and DC Reliability in GaN HEMTs

Joh , del Alamo , Chowdhurry , and Jimenez

RFLT after DCLT



RF stress is much harsher stress condition!

→ Higher V_{DS}>40 V due to voltage swing

2008 CSIC Symposium

October 13-15, 2008

GaN hot topic

millmeter-wave

MMIC

RF switch

X-Band/Broadband GaN Power Amplifiers

Low noise amplifiers

Constant phase over a broad band

GaN used in applications without full proven reliability

2008 CSIC Symposium

SESSION A: PLENARY SESSION

The DARPA COmpound Semiconductor Materials On Silicon (COSMOS) Program

John C. Zolper, Microsystems Technology Office (MTO), Defense Advanced Research Projects Agency (DARPA)

Transistor-scale heterogeneous integration of advanced compound semiconductor (CS) devices with state of the art silicon circuits.

Northrop-Grumman micro-assembly approach

Raytheon developing a monolithic epitaxial technique to directly grow CS materials onto silicon substrates

HRL Laboratories doing both

2008 BCT Meeting

BCTM Keynote

Technology Convergence Creating New Opportunities for Innovation

G. Amelio Jazz Technologies, former Apple and National Semiconductor CEO

Reconfigurable hardware

Many gates on a chip are not being used but are consuming space and power